

verifications to be 87.5 per cent. The percentage of verifications for the four elements have been: weather, 90.7; wind, 83.7; temperature, 88.7; barometer, 87.0. The percentage of verifications by geographical districts have been: New England, 87.6; Middle States, 88.4; South Atlantic States, 87.3; East Gulf States, 87.2; West Gulf States, 89.1; Lower Lake region, 85.3; Upper Lake region, 87.4; Tennessee and Ohio valley, 86.8; Upper Mississippi valley, 89.4; Lower Missouri valley, 86.8. Of the 3,704 predictions that have been made, 63, or 1.7 per cent., are considered to have entirely failed; 16, or 4.4 per cent., were one-fourth verified; 409, or 11.1 per cent., were one-half verified; 295, or 8.0 per cent., were three-fourth verified; 2,776, or 75.0 per cent., were fully verified, so far as can be judged from the tri-daily weather maps.

Cautionary Signals.—During the month, 234 Cautionary Signals were displayed; 207, or 88.4 per cent., were justified by subsequent hourly velocities of 25 miles or over at, or within 100 miles of the station.

Cautionary Off-Shore Signals—thirty-two signals not included in the preceding—were ordered up as Cautionary Off-Shore Signals; 25, or 78.1 per cent. of these were justified both as to velocity and direction. Sixty-two Cautionary Signals were changed to Off-Shore Signals, and as to velocity, are considered with the Cautionary,—as to direction, 58 or 84 per cent., were justified. Fifty-nine cases were reported, generally from scattered stations, of winds of 25 miles or over when signals were not ordered.

NAVIGATION.

In the table on the right-hand of chart No. 111, are given the highest and lowest readings on the Signal Service river gauges during the month, with dates of same, from an examination of which it will be seen that the rivers have continued quite low throughout.

Ice in Rivers.—Floating and shore ice was reported in the Missouri and Red river of the North, from the 26th to the 29th, at Fort Rice, Bismarck and Pembina; at Morrilton, Dak., the James river was frozen over on the 27th, but on the 31st all the ice had disappeared.

High Tides.—Portsmouth, N. C., 3d, 4th; Tybee Island, S. C., 27th, 29th; Cape May, N. J., 23d, highest tide since 1821, all small objects swept before it; Dover, Del., 23d, highest tide known for years; Mt. Desert, Me., 24th, 28th; Flushing, N. Y., 23d, in Flushing Bay, three feet higher than usual.

ATMOSPHERIC ELECTRICITY.

Thunder-Storms.—1st, Minn., Ill., Ind., Ia., Mo., Neb., Wis., Ariz., Mich. 3rd, Kan. 4th, Ill., Kan., Mo., Vt. 5th, Col., Kan., Mo. 6th, Ia., Mo. 7th, N. C., Va. 8th, Tex., Ill., Ia., Mich., Wis., Kan. 9th, N. Y., Conn., Ill., Ind., Ky., Me., Mass., Mo., N. H., N. J., Ohio, Vt., Pa. 10th, Ill., Ia., Kan., Mo., Neb., Wis. 11th, Ind., Ky. 12th, Ia., Wis. 13th, Ill., Ia., Mo., Ohio. 14th, Ia., Mich., Ohio, Wis. 15th, Dak., Me., Mich., Minn., Ill., Ia., Kan., Mo., Neb., N. Y., Wis. 16th, Ill., Ia., Kan., Mich., Mo., N. Y., Wis. 18th, Ia., Va. 22nd, Va. 23rd, Va. 25th, Ind. 26th, Ill. 27th, N. J. 30th, Tenn., Va.

Anroras.—Bismarck, Dak., 21st; Madison, Wis., 25th; Escanaba, Mich., 19th; Eastport, Me., 21st; Ft. Wayne, Ind., 12th, 31st; Nora Springs, Ia., 16th; Cape Vincent, N. Y. 22nd; Garrettsville, Ohio, 11th; Woodstock, Vt., 28th; Manitowoc, Wis., 19th.

Telegraphic Communication Interfered with by Atmospheric Electricity.—Boerne and McKavitt, Tex., 8th.

OPTICAL PHENOMENA.

Solar Halos.—1st, Ill.; 2d, N. Y., Md., Ohio; 3d, Cal., Iowa; 4th, Ohio, R. I., Conn.; 5th, R. I.; 6th, Iowa; 7th, Conn., Ill., Ind., Iowa, Md., N. J., N. Y., Ohio, Vt., Md., Dak., Ga., R. I.; 8th, Conn., Ind, Me., N. Y., Ohio, Md., Dak., Ga., R. I.; 9th, Ky., Mass., Md., Fla., S. C., Ga.; 10th, Ind., Ohio, Md., N. C.; 11th, Conn., Me., Miss., N. J., N. Y., Ohio, R. I.; 12th, Ind., Iowa; 13th, Ind., N. Y., Ohio, Md.; 16th, N. Y., Vt., Md., N. C., S. C., R. I.; 17th, Conn., N. J., N. Y., R. I.; 20th, Md.; 22d, N. H., N. J.; 25th, N. Y., Ohio; 26th, N. J., N. Y., Pa.; 27th, N. Y., Pa.; 29th, Ind., N. Y., Ohio; 30th, Md.

Lunar Halos.—1st, N. Y. 2nd, Dak. 3rd, Ill. 4th, Iowa, Mass., Vt., R. I. 5th, Ga., Ill., Ky., Miss., Vt., Neb. 6th, Ill., Ky., Mich., Miss., N. Y., Vt., Neb., Mo., Ohio. 7th, Fla., Ind., Maine, Mass., Ohio, Neb., Ill., Conn. 8th, Conn., Fla., Maine, Mass., Ohio, Vt., Tex., Fla., Ill., S. C., Ga., N. J., R. I. 9th, Conn., N. C., Vt., Md., Neb., Fla., Mich., N. Y., Ohio, S. C., Ga., Pa., Mass. 10th, Ill., Ind., Iowa, Md., Mo., N. J., N. Y., N. C., Ohio, Pa., Vt., Md., N. H., Conn., Maine. 11th, Maine, Ohio, N. Y. 12th, Ill., Iowa, Wis., Neb., Mo., Pa. 13th, Conn., Ind., Iowa, Mass., N. Y., Ohio, Vt., R. I. 14th, Conn., Maine. 15th, Iowa, N. Y., Maine. 16th, Ind., Iowa, Maine. 17th, N. Y., Ill. 21st, N. Y. 22nd, Md., Maine. 24th, N. Y. 28th, Ind. 29th, Me. 30th, Neb. 31st, N. J., Wis.

Mirage.—Burlington, Vt., 20th; New London, Conn., 2nd, 3rd, 5th, 6th, 7th, 25th, 28th, 29th.

MISCELLANEOUS PHENOMENA.

BOTANICAL.—*Maine*—Cornish, 14th, forest foliage changed color; 10th, field strawberries and dandelions in bloom since the middle of last month, and some ripe fruit. *Massachusetts*—Somerset, 1st to 10th, harvesting corn. Fall River, in bloom, 21st, pear and some forest trees; 26th, trailing or butus in full bud. Westboro, 1st to 29th, flowers blooming in field and garden. Waltham, 7th to 25th, forest leaves falling rapidly, 26th, almost stripped of leaves. *Michigan*—Northport, 31st, fall crops, corn, potatoes and buckwheat